

**First Seminar on Information Exchange  
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*March, 20 - Rio de Janeiro - Carneiro Felipe Auditorium*

# Brazilian Nuclear Program: Confidence Building Measures

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# Brazilian Nuclear Program: Confidence Building Measures

## Summary

- ✓ Brazilian Regulatory Framework in Nuclear Safety
- ✓ Confidence Building Measures:
  - ✓ Adherence to International Treaty, Convention, etc.;
  - ✓ Participation in International Cooperation Initiatives;
  - ✓ Measure to develop and maintain competence; and
  - ✓ Transparency and communication with the public.
- ✓ Conclusion

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# Brazilian Regulatory Framework in Nuclear Safety

## Brazilian National Nuclear Energy Commission - CNEN

Federal Autarchy created in  
**1956**

*National Authority (NRA). Regulatory*



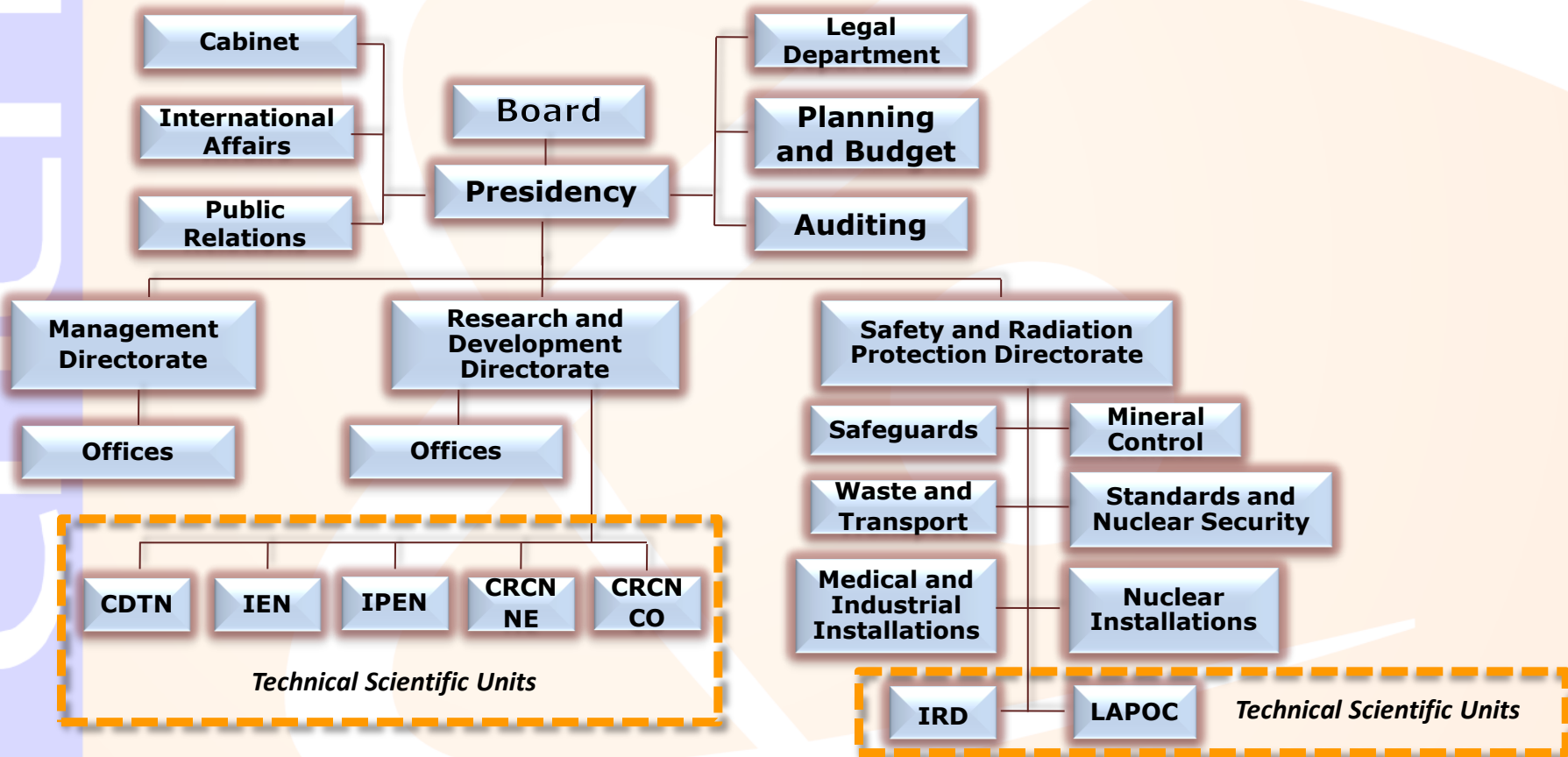
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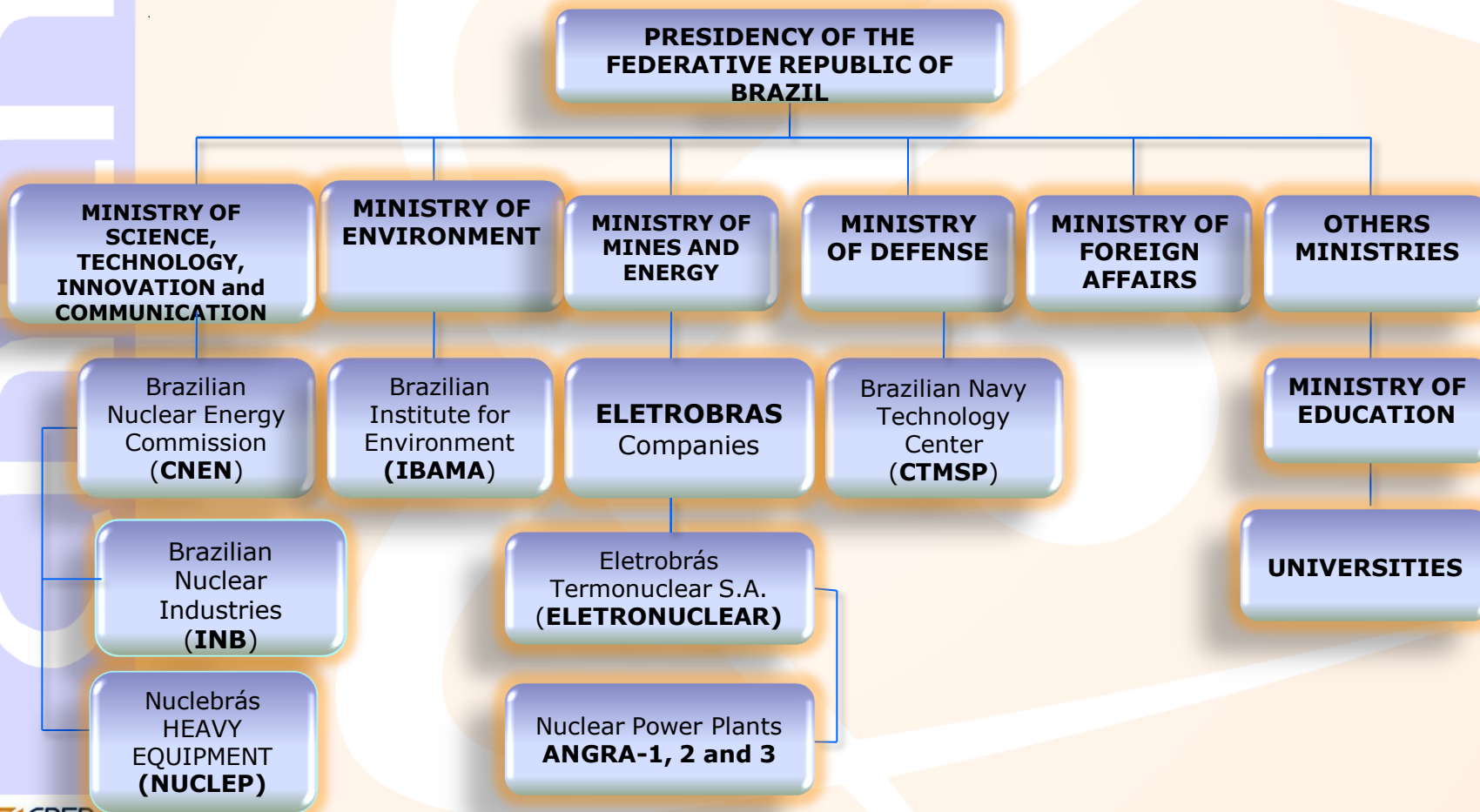
# Brazilian Regulatory Framework in Nuclear Safety

## CNEN – Organizational Structure



# Brazilian Regulatory Framework in Nuclear Safety

## Brazilian Nuclear Sector – Main Organizations



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# The General Coordination of Reactors and Fuel Cycle (CGRC) (Nuclear Facilities under Regulatory Control)

- ✓ 3 Power Reactors (1 under construction );
- ✓ 1 Complementary Storage Unit for Irradiated Fuels (UAS) – Dry Storage Facilities;
- ✓ 4 Research reactors;
- ✓ Laboratory of Nuclear Electrical Generation (LABGENE);
- ✓ Enrichment Plant; (1 Industrial Plant and 2 pilot plants);
- ✓ Re-conversion to  $UO_2$  (1 Industrial Plant and 1 pilot plant);
- ✓ Fuel Assembly Facilities (1 Industrial Plant and 1 pilot plant); ;
- ✓ Uranium Mining and ore Processing Facilities;
- ✓ Conversion to  $UF_6$  ; (Pilot plant);
- ✓ Shipyard and Naval Base (EBN);
- ✓ Brazilian Nuclear Submarine SN-BR;
- ✓ Brazilian Multipurpose Reactor (RMB), etc.

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# The General Coordination of Reactors and Fuel Cycle Facilities (CGRC) (Nuclear Facilities under Regulatory Control)



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# The General Coordination of Reactors and Fuel Cycle (CGRC) (Nuclear Facilities under Regulatory Control)



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# The General Coordination of Reactors and Fuel Cycle (CGRC) (Nuclear Facilities under Regulatory Control)



**The Laboratory of Nuclear Electrical Generation  
(LABGENE)  
Iperó/SP**

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# The General Coordination of Reactors and Fuel Cycle (CGRC) (Nuclear Facilities under Regulatory Control)



**The Unit of Uranium Hexafluoride (UF6)  
Iperó/SP**

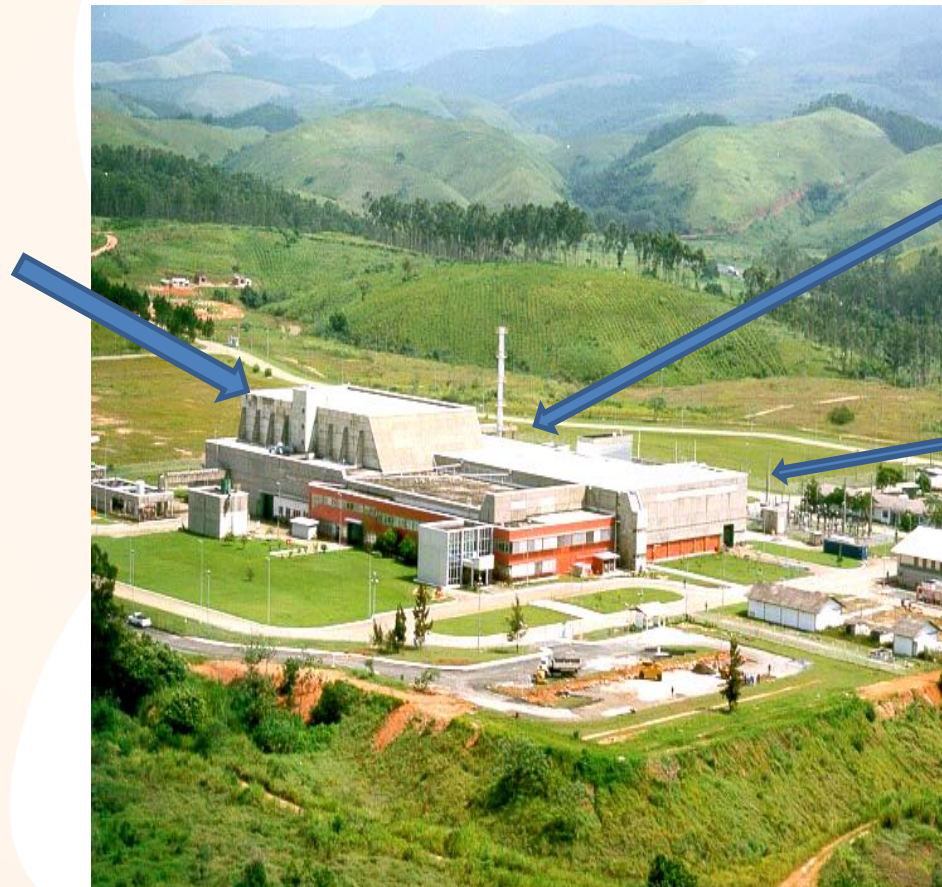
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# The General Coordination of Reactors and Fuel Cycle (CGRC) (Nuclear Facilities under Regulatory Control)

**Enrichment Plant**



**Fuel Pellets**

**Reconversion Plant**

**The Unit of Enrichment, Reconversion and Fuel Pellets  
Facilities (Resende/RJ)**

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# The General Coordination of Reactors and Fuel Cycle (CGRC) (Nuclear Facilities under Regulatory Control)



**The Unit of Fuel Assembly  
Resende/RJ**

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# The General Coordination of Reactors and Fuel Cycle (CGRC) (Nuclear Facilities under Regulatory Control)

## MINERAÇÃO E PRODUÇÃO DE CONCENTRADO DE URÂNIO



**INB CAETITÉ (LAGOA REAL/BA)**

**Produção atual: 400 t/ano**



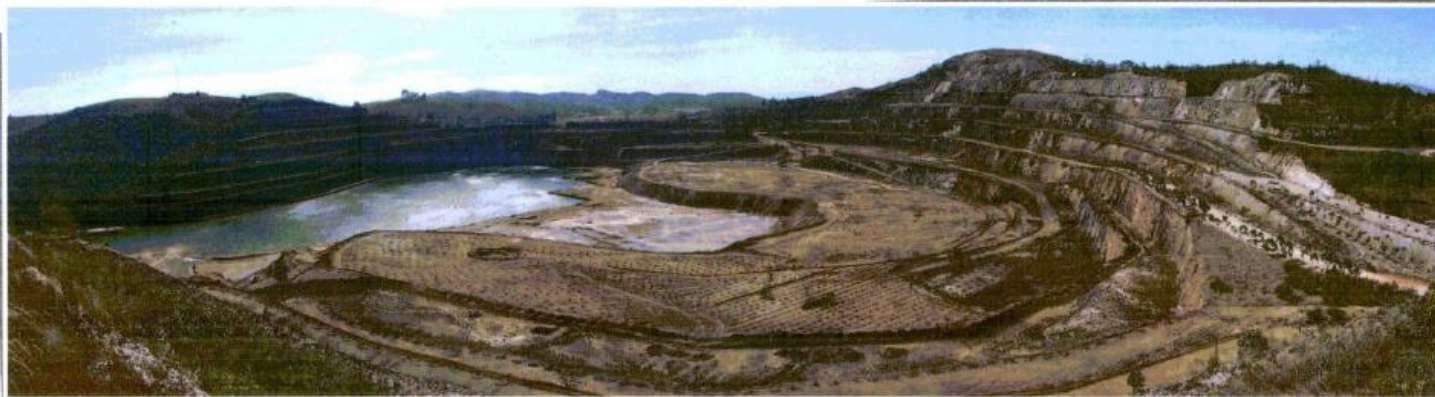
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**The Unit of Mining and Milling**

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# The General Coordination of Reactors and Fuel Cycle (CGRC) (Nuclear Facilities under Regulatory Control)



Poços de Caldas Mining and Milling Facilities

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# Brazilian Nuclear Program: Confidence Building Measures

## Confidence Building measures:

- Formalize the commitment for the safety and peaceful use of nuclear energy by adhering to an international treaty;
- Participation in International Cooperation Initiatives;
- Measure to develop and maintain competence;
- Openness and transparency of regulatory activities

# Confidence Building: Nuclear treaties, Conventions and Agreements that Brazil is part of.

## Multilateral Agreements

	Title	In Force	Status
<a href="#"><u>P&amp;I</u></a>	Agreement on the Privileges and Immunities of the IAEA	1966-06-13	acceptance: 1966-06-13
<a href="#"><u>VC</u></a>	Vienna Convention on Civil Liability for Nuclear Damage	1993-06-26	accession: 1993-03-26
<a href="#"><u>CPPNM</u></a>	Convention on the Physical Protection of Nuclear Material	1987-02-08	Signature: 1981-05-15 ratification: 1985-10-17
<a href="#"><u>NOT</u></a>	Convention on Early Notification of a Nuclear Accident	1991-01-04	Signature: 1986-09-26 ratification: 1990-12-04
<a href="#"><u>ASSIST</u></a>	Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency	1991-01-04	Signature: 1986-09-26 ratification: 1990-12-04
<a href="#"><u>NS</u></a>	Convention on Nuclear Safety	1997-06-02	Signature: 1994-09-20 ratification: 1997-03-04

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# Confidence Building: Nuclear treaties, Conventions and Agreements that Brazil is part of.

## Multilateral Agreements

	Title	In Force	Status
<a href="#"><u>RADW</u></a>	Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management	2006-05-18	Signature: 1997-10-31 ratification: 2006-02-17
RSA	Revised Supplementary Agreement Concerning the Provision of Technical Assistance by the IAEA (RSA)	1991-02-27	Signature: 1991-02-27
<a href="#"><u>ARCAL</u></a>	Co-operation Agreement for the Promotion of Nuclear Science and Technology in Latin America and the Caribbean (ARCAL)	2006-03-27	Signature: 1999-08-04 ratification: 2006-03-27

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# Confidence Building: Nuclear treaties, Conventions and Agreements that Brazil is part of.

## Safeguards Agreements

Reg.No	Title	In Force	Status
1647	Agreement between the Republic of Argentina and the Federal Republic of Brazil, the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials and the IAEA for the Application of Safeguards	1994-03-04	Signature: 1991-12-13
1687	Exchange of letters in connection with the Treaty for the Prohibition of Nuclear Weapons in Latin America and the Caribbean	1997-06-10	Signature: 1997-05-22
1708-0	Exchange of letters in connection with NPT and Tlatelolco Treaty	1999-09-20	Signature: 1999-07-30

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# Confidence Building: International Activities

## ➤ **IAEA:**

✓ *CNEN actively participates in many IAEA Committees:*

- ✓ *CSS -- Commission on Safety Standards,*
- ✓ *NUSSC - Nuclear Safety Standards Committee,*
- ✓ *WASSC - Waste Safety Standards Committee,*
- ✓ *TRANSCC - Transport Safety Standards Committee,*
- ✓ *RASSC - Radiation Safety Standards Committee,*
- ✓ *EPRReSC - Emergency Preparedness and Response Standards Committee,*
- ✓ *NSGC - Nuclear Security Guidance Committee and*
- ✓ *INSAG – International Safety Advisory Group.*

✓ *CNEN is an active member of the IRS and IRSRR systems and contributes yearly with the presentation of events on the general meetings;*

✓ *CNEN staff participates in many IAEA Technical Meetings.*

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# Confidence Building: International Activities

## Participation in Bilateral Cooperation

### ➤ **CNEN – GRS:**

- ✓ *Co-operation agreements between GRS and CNEN for Exchange of Technical Information and Co-operation in Regulatory and Safety Research Matters;*
- ✓ *Date of Agreement conclusion: 02.10.1997;*
- ✓ *Ongoing Activities:*
  - ✓ *Operational Experience;*
  - ✓ *Probabilistic Safety Assessment;*
  - ✓ *Severe Accident Analysis;*
  - ✓ *Digital I&C; etc.*

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# Confidence Building: International Activities Participation in Bilateral Cooperation

European  
Commission

## ➤ **BR – EC Project BR3.01/09**

✓ *Nuclear Safety Cooperation with the Regulatory Authority of Brazil (CNEN)*

✓ *Finalized: November 2013*

## ➤ **BR – EC Project BR3.01/12**

✓ *Support to the Nuclear Safety Regulator of Brazil*

✓ *Begin: 2015*

✓ *Finalization: May 2018*

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# Confidence Building: Interantional Activities Participation in Regional Cooperation



## ***Bi-National Commission on Nuclear Energy (COBEN):***

### ➤ ***COBEN Brazil – Argentine***

✓ *Practical & Knowledge Exchange in the Nuclear Field;*

✓ *Ongoing Project:*

✓ *construction of two reactors: the Brazilian Multipurpose Research Reactor (RMB) and the RA-10 in Argentina.*

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# Confidence Building: Participation in Regional Safety and Security Framework



Foro Iberoamericano de Organismos Reguladores  
Radiológicos y Nucleares

## The Ibero-American Forum

*FORO*



what it is

an **Association of Iberoamerican Radiological & Nuclear Regulatory Authorities** created in 1997. Initially based on similarities among the **nuclear programs** in place, similar **languages** and similar **cultural features**

its aim

to promote **radiological and nuclear safety and security** at the highest level in the region

its official  
language

**Spanish**

[www.foroiberam.org](http://www.foroiberam.org)

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Foro Iberoamericano de Organismos Reguladores Radiológicos y Nucleares

# Confidence Building: Participation in Regional Safety and Security Framework

## The Ibero-American Forum

### Who we are



Argentina



Autoridad Regulatoria Nuclear

Brazil



Comissão Nacional de Energia Nuclear

Chile



Comisión Chilena de Energía Nuclear

Cuba



Centro Nacional de Seguridad Nuclear

Mexico



Comisión Nacional de Seguridad Nuclear y Salvaguardias

Spain



Consejo de Seguridad Nuclear

Peru



Instituto Peruano de Energía Nuclear

Uruguay



Autoridad Reguladora Nacional en Radioprotección

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Foro Iberoamericano de Organismos Reguladores  
Radiológicos y Nucleares

# Confidence Building: Participation in Regional Safety and Security Framework

***The Brazil took part of the following FORO's projects:***

- ***Project PREEV (2009 – 2011);***
- ***Project “Iberoamerican stress tests” (2011 – 2018),***
- ***Project on development of Regulatory Bodies competences in Nuclear Safety (2012 – 2014), etc.***

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Comissão Nacional  
de Energia Nuclear  
MINISTÉRIO DA  
CIÊNCIA, TECNOLOGIA,  
INOVAÇÕES E COMUNICAÇÕES





Foro Iberoamericano de Organismos Reguladores  
Radiológicos y Nucleares

# Confidence Building: Participation in Regional Safety and Security Framework

***The Brazil participating in the following FORO's projects now:***

- ***Regulatory practices in licensing of nuclear reactor operators;***
- ***Standardization of the Inspection Process and the Research Reactor Aging project,***
- ***Pilot application of the methodology of Evaluation of the Safety Culture of the FORO Guide to an Industrial Gammagraphy company, etc.***

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INOVAÇÕES E COMUNICAÇÕES



# Confidence Building: Measure to develop and maintain Competence

- ***CNEN is constantly evaluating its staff needs, considering the new licensing projects and the retirement of staff;***
- ***The maintenance of the staff is still a challenge because of the high age average;***
- ***The CGRC technical staff receives nuclear general training and specific training according to the field of work at national and international organization, including both academic training and courses attendance, technical visits, participation in workshops, and on technical committee meetings mostly sponsored by IAEA and European Commission.***



# Confidence Building: Measure to develop and maintain Competence

- *Also there is a technical cooperation agreement with German GRS to exchange information on the areas of operational events, PSA and Severe Accident.*
- *On the area of emergency preparedness, CGRC is an active member of the ARGOS consortium and participate on the yearly seminar to share experience with other international users.*
- *The cooperation project between CNEN and European Community entitled: “Training and Tutoring for experts of the NRAs and their TSOs for developing or strengthening their regulatory and technical capabilities”, the multi-country projects MC3.01/10, MC3.01/11, MC3.01/14 and MC3.01/16.*

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# Confidence Building: Measure to develop and maintain Competence

*Cooperation Projects in Training and Tutoring 2014 – 2017:*

## ➤ **European Commission Projects**

- ✓ 2014 - Training of 16 specialists
- ✓ 2014 – Tutoring of 01 specialist
- ✓ 2015 - Training of 28 specialists
- ✓ 2015 – Tutoring of 02 specialists
- ✓ 2016 – Training of 14 specialists
- ✓ 2017 – Training of 1 specialist.

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# Confidence Building: Measure to develop and maintain Competence

➤ ***CNEN started in 2013, with support of IAEA, a project related to Building Capacity through Knowledge and Quality Management (KQM) Programme. The project encompasses three major areas:***

➤ ***assessment of key knowledge (existing and needs),***

➤ ***development of strategy to capture and retain key knowledge needed for regulatory process of the Brazilian nuclear installations nuclear fuel cycle installations, and***

➤ ***development and implementation of methodology (i.e. Mechanisms and tools) for identifying, capturing and disseminating lessons learned and good practices in key regulatory competence areas.***

➤ ***There were two workshop in CNEN's Headquarters in Rio de Janeiro, the first one was held in November, 2013 and was more related to the fundamentals, concepts, definitions, strategy, tools and mechanisms of a Capacity Building and a KQM Programme. The second Workshop occurred in August, 2015 more focused in practical examples, discussions and diagnosis. In both workshop the attendance was over 80 % of the staff.***

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# Confidence Building: Measure to develop and maintain Competence

- *Based on the discussions the CGRC created at the end of 2015 a Working Group to propose a plan to develop a KQM Programme.*
- *In parallel to the IAEA initiative the CGRC participate from 2012 to 2015 in a project of the FORO Iberomericana for Regulators related to Nuclear Regulatory Competences, which led to the publication of a document together with IAEA , IAEA-TECDOC-1794 (in Spanish), Guía para la Elaboración de un Programa de Creación y Desarrollo de Competencias de Reguladores de Reactores Nucleares.*

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# Confidence Building: transparency and communication with the public

- ***CNEN is a governmental agency and as such is subject to Access to Information Act (Law 12.527/11), this law regulates the right of access to public information and establishes the principle of maximum disclosure of information held by public authorities, and secrecy as an exception. The exceptions are linked with proprietary information, security-related information and sensitive information.***
- ***Questions can be done in the Government Website and it has 30 days to be answered.***
- ***CNEN makes available at <http://www.cnen.gov.br> all information related to nuclear activities and the national policy, the public.***
- ***Public consultation is part of the standard and regulations development process and has the objective of improving the Transparency of nuclear regulations elaboration process, allowing the participation of interested parties such as professional associations directly involved, organizations interested in its application and the general public.***

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# Conclusion

***Based on the several Confidence building measures implemented in Brazil, and taking into account the active participation of Brazil in the different safety committees and programs of the IAEA and other international cooperation, the Brazilian nuclear organizations consider that its nuclear program has:***

- offering greater confidence to the international community that its nuclear program is peaceful;***
- The involvement and harmonizations of work with the other international agencies, institutions, etc. were determinant for this process;***
- The existing arrangements, such as the nuclear safeguards regime implemented by ABACC, serve a very important role in that sense.***

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# Conclusion

*The understanding that the development of confidence building mechanisms would serve to create an adequate environment for a greater cooperation between Brazil and other countries, simultaneously working as a foundation for international credibility concerning Brazilian nuclear program, making possible the access to refined technologies in the international market.*

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**Thank you for your attention!**



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